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COLLECTION OF ENGRAVINGS,

DESIGNED TO FACILITATE THE

STUDY of MIDWIFERY,

EXPLAINED AND ILLUSTRATED.

BY

JAMES HAMILTON, JUNIOR, M. D.

FELLOW OF THE ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.

LONDON:
PRINTED FOR G. G. & J. ROBINSON.

1796.

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TO

AND. DUNCAN, M. D.

PROFESSOR OF MEDICINE IN THE UNIVERSITY OF
EDINBURGH, &c.

THIS Attempt to facilitate the Study of Midwifery, is preſented as a ſmall offering of gratitude, by

His Obliged, Humble Servant,

JAS. HAMILTON, JUNIOR.

EDINBURGH,
April 20th, 1796.

a

PREFACE.

BY the Art of Drawing, the external appearances of many objects can be ſo accurately repreſented in miniature, as to communicate a juſt idea of their figure and their proportions. Such are objects of a large ſize, diſtinguiſhed by prominent features, and rendered familiar to mankind by daily obſervation.

But it is impoſſible to draw a miniature repreſentation that can be readily recogniſed, of thoſe objects which are compoſed of various microſcopic parts united together ſo as to preſent a ſurface of curved lines, becauſe the minima viſibilia cannot be exhibited; ſince it is by theſe alone, and not by the proportions which the ſeveral parts bear to each other, that an idea is formed of the external characters of objects of this kind. It is this which renders it ſo exceedingly difficult to repreſent anatomical ſubjects on a ſmall ſcale. To thoſe whom conſtant habit has not made intimately acquainted with the particular parts deſigned to be ſhewn, a miniature picture of an organ of an animal body cannot convey ſuch impreſſions as ſhall enable them to judge of the real appearance of the object thus delineated.

On this account, judicious anatomiſts have always choſen to make their drawings of the ſame ſize with the object they repreſent.

Many circumſtances, however, conſpire againſt the publication of engravings literally copied from ſuch drawings. The expences attending publications of that kind limit their circulation; and hence, in the execution of theſe works, much time and labour are expended, without the ſatisfaction of contributing to public utility being reaped in return.

The truth of this obſervation is well illuſtrated in the hiſtory of Dr Hunter's plates on the Gravid Uterus, and of Dr Smellie's Anatomical Tables.

Although the former of theſe publications be highly intereſting to ſtudents of anatomy, of painting, and of engraving; a ſmall number of copies only, and theſe at a reduced price too, have been ſold.—And within theſe few years, the copperplates of Dr Smellie's work (the firſt publication in this iſland calculated to explain the mechaniſm of human parturition), from which no more than eighty copies had been thrown off, were actually purchaſed for the price of old copper.

Theſe conſiderations have ſuggeſted the expediency of reducing the ſize of engravings relating to anatomical ſubjects to a ſcale calculated to afford the work at a ſmall price.—Theſe ſerve the purpoſe of recalling to the mind of the ſtudent the great outlines of the objects he formerly examined, which, without ſome ſuch help, might readily eſcape his recollection.

To ſtudents of midwifery, drawings are as neceſſary as to ſtudents of anatomy; and therefore, Dr. Smellie's plates were a long time ago publiſhed in a miniature form.——

But within theſe few years, a taſte for a certain degree of neatneſs in the execution of engravings, which Smellie's ſmall plates do not gratify, has prevailed ſo much, that their ſale is now almoſt entirely ſtopt.

A conviction that, without the uſe of plates, the phenomena of the Gravid Uterus, and the mechaniſm of labour, cannot be underſtood by ſtudents who have not the opportunity of examining frequently and carefully, the objects repreſented by ſuch plates, induced the Editor to undertake the following little work.

It contains a collection of what is moſt eſſential, from the publications of Dr Hunter, Dr Smellie, and Profeſſor Boehmer; together with two or three drawings from preparations in poſſeſſion of the Editor's father—— To make a complete ſyſtem, ſome more plates are required; and theſe, if the preſent undertaking prove acceptable to the public, ſhall be furniſhed at a future period.

The plates are executed in a ſtyle of great neatneſs by Mr Beugo, whoſe merit is well known. The Editor has endeavoured to point out with care, the practical utility of each plate. That his ſole object has been to facilitate the ſtudy of Midwifery, is unequivocally evinced, by the moderate price at which the work is afforded.

Edinburgh,
April 20th, 1796.

Plate I.

Fig. I.

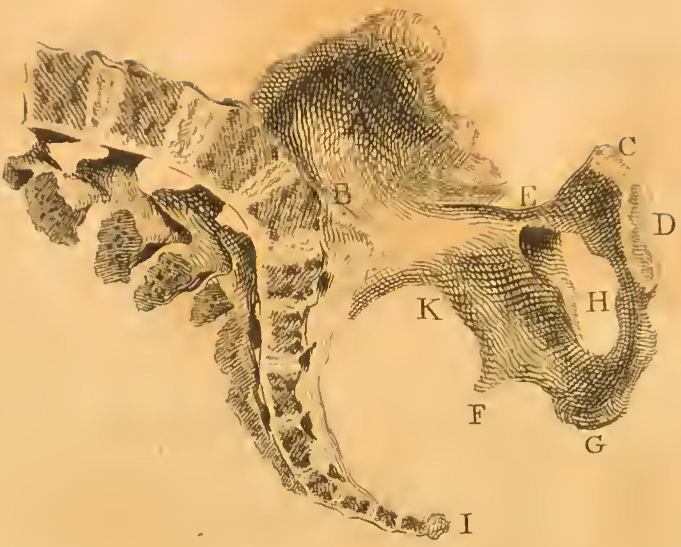

Fig. 2

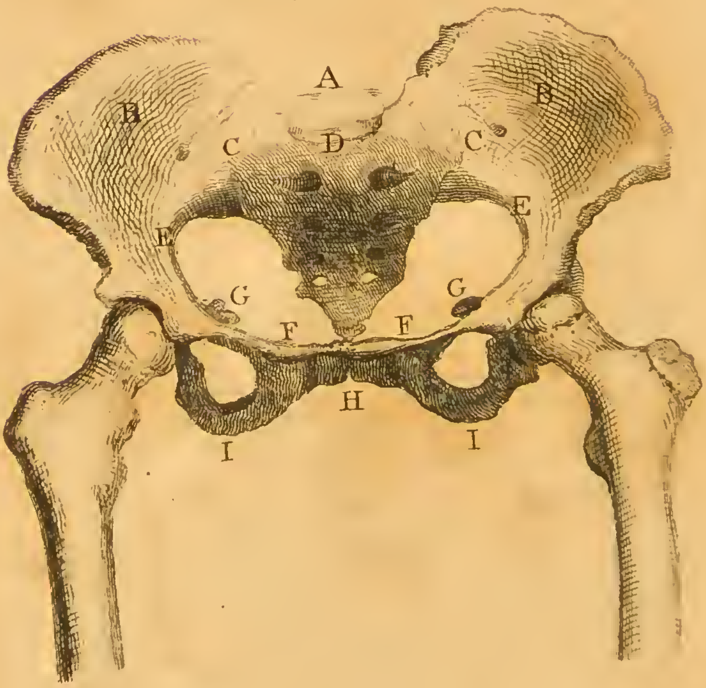

PLATE I.

PELVIS OF THE SKELETON OF THE FEMALE.

FIGURE 1*ſt*, Repreſents a Vertical Section of the Pelvis.

A, The ilium.

B, The promontory of the ſacrum.

C, The angle of the os pubis.

D, The ſurface by which the pubes are joined to form the ſymphyſis pubis.

E, The body of the pubis at its junction with the ilium.

F, The ſpinous proceſs of the iſchium.

G, The tuberoſity of the iſchium.

H, The foramen thyroideum.

I, The point of the coccyx.
K, The ſacro-ſciatic notch.

THE chief purpoſe of this figure is to ſhew the depth of the cavity of the Pelvis at different parts. Thus the depth commonly is, poſteriorly from B to I ſix inches, at the ſide from E to G four inches, and from the upper to the lower edge of the ſurface D (by which the pubes are joined), from an inch and an half to two inches.

Unleſs theſe various depths be kept in mind, a practitioner would be very much deceived in eſtimating the progreſs of the child's head through the pelvis during labour; for after it has advanced only one third within the cavity, it is at the inferior part of the pelvis anteriorly, and hence might appear juſt on the point of being protruded completely.

FIGURE 2*d*, Exhibits a general view of the Pelvis ſeen anteriorly when the ſkeleton is in the erect poſture.

A, The laſt lumbar vertebra.
B B, The ilium.
C C, The ſacro-iliac ſynchondroſis.
D, The promontory of the ſacrum.
E E, The moſt diverging points of that part of the linea innominata which belongs to the ilium on each ſide.

F F, The body of the pubes.
D E F F E, The brim of the pelvis.
G G, The ſpinous proceſſes of the iſchia.
H, The lower point of the ſymphyſis pubis.
I I, The tuberoſities of the iſchia.
I H I, The arch of the pubes.

This figure is deſigned to repreſent the natural ſituation of the brim of the pelvis in the erect poſture.

It lies in a ſlanting direction from the ſpine towards the horizon, for the poſterior part is ſituated about three inches higher than the anterior.—The conſequence of this is, that the line of the axis of the pelvis is different from that of the body, becauſe a ſtraight line produced from the lumbar column is perpendicular to the horizon. Whereas a line drawn through the centre of the pelvis, forming its axis (when extended paſſing through the umbilicus and the anus), is oblique towards it.

By this ſituation of the pelvis, the contents of the abdomen are prevented from paſſing through it by their own gravity.

This repreſentation illuſtrates alſo Dr. Denman's beautiful idea, that the poſterior part of the pelvis forms an arch, of which the ſacrum is the key ſtone, and the thigh bones are the pillars, and that at the fore-part, there is a counter arch which ſtrengthens the former. From this and other circumſtances relating both to the ſtructure of the pelvis and to the changes induced on it by diſeaſe, it is very juſtly inferred, that there is no natural ſeparation of the bones during labour.

Plate II.

Fig. 1.

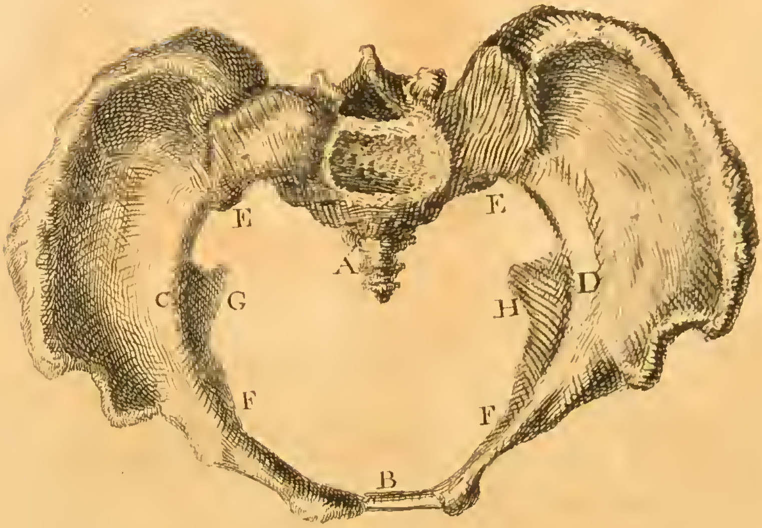

Fig. 2.

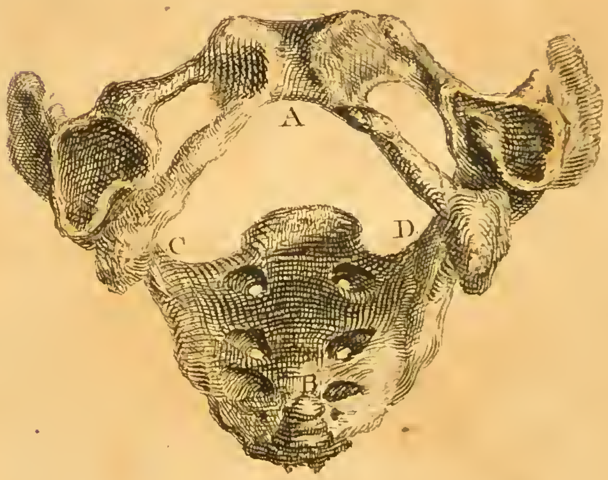

PLATE II.

PELVIS IN THE SKELETON OF THE FEMALE, CONTINUED.

FIGURE 1*ſt*, Exhibits a View of the Brim of the Pelvis.

A B, The ſhort diameter meaſuring ſomewhat more than 4 inches.

C D, The longeſt diameter in the ſkeleton, meaſuring about 5 inches; but as the bellies of the pſoæ muſcles, lodged at theſe points of the linea innominata, occupy on each ſide the ſpace of half an inch, this is not the long diameter in the living ſubject.

E F E F, The diagonal, or oblique diameter in the ſkeleton, and the long diameter in the living ſubject, extending from the ſacro-iliac ſynchrondroſis on one ſide, to the point of the linea innominata, correſponding with the centre of the inner border of the acetabulum, on the oppoſite ſide, and meaſuring ſomewhat more than four inches and a half.

G H, Repreſents the diameter of the cavity of the pelvis, between the ſpinous proceſſes of the iſchia, and is noticed here, becauſe its length is pretty exactly the ſame with that of the ſhort diameter A B at the brim.

FIGURE 2*d*, Repreſents the outlet of the Pelvis.

A, Centre of the arch of the pubes.

B, Point of the coccyx.

C D, Tuberoſities of the iſchia.

A C B D, Are points equidiſtant, being diſtant from each other about four inches. But as in the recent ſubject, the pieces of which the coccyx are compoſed are moveable commonly until the fortieth year; the point of the coccyx (B) is capable of being made to recede about an inch; and as, where the pieces are anchyloſed, the range loſes one half of its length, which produces the ſame effect, the longeſt diameter at the outlet, is from the centre of the arch of the pubes to the point of the coccyx A B, which is in the ſame direction as the ſhort diameter of the brim.

Plate III.

Fig. 1.

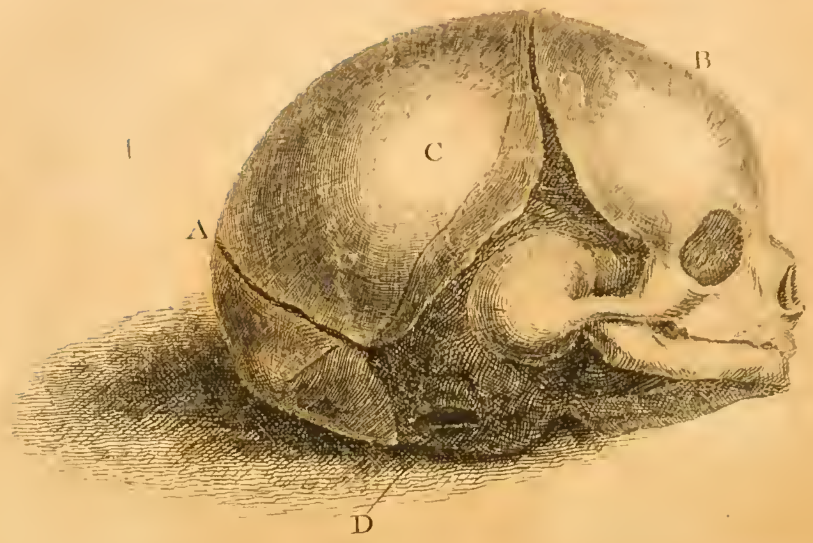

Fig. 2.

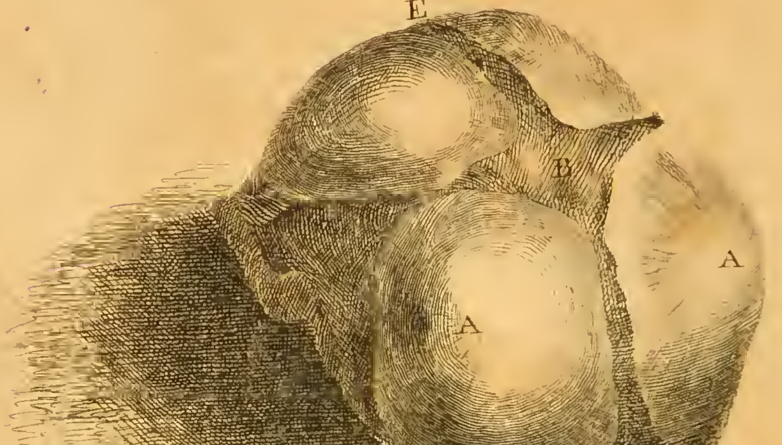

PLATE III.

HEAD OF THE SKELETON OF A NEW-BORN CHILD OF THE ORDINARY SIZE, AT THE FULL PERIOD OF UTERO-GESTATION.

FIGURE 1*ſt*, Exhibits the head ſo much inclined to one ſide, that a view of the baſe of the cranium is given.

A, The occipital bone.
B, The right frontal bone.
C, The right parietal bone.
D, The foramen magnum.

This figure is chiefly deſigned to communicate an idea of the general appearance of the fœtal ſkull. The particular poſition in which it is repreſented, was choſen in order that the ſituation of the foramen magnum might be ſeen. It is owing to the circumſtance of that opening being nearer to the occiput than to the face, that the vertex is puſhed foremoſt during the proceſs of natural labour.

FIGURE 2*d*, Repreſents the head placed in ſuch a ſituation that the ſuperior part of the cranium is ſeen.

A A, The protuberances of the parietal bones, diſtant from each other about three inches and an half, and forming the ſhort diameter of the head.

B, The anterior fontanelle.

C, The poſterior fontanelle.

E D, The long diameter of the head, viz. from the frontal to the occipital bone, meaſuring about four inches and an half.

This figure is intended to ſhow the dimenſions of the long and ſhort diameter of the head, and the ſituation of the anterior and poſterior fontanelles.

Although the diſtance between the parietal protuberances A A be three inches and an half, that is not to be regarded as the length of the ſhort diameter; for in conſequence of the parietal bones being connected by a membranous ſubſtance, the protuberances are capable of being made to approach each other, the edges of the bones overlapping, ſo as to reduce the diameter between them to three inches.

The effect of the compreſſion of the head, is rendering the fœtus inſenſible; and hence, during labour it is a paſſive body only. It is from having overlooked this circumſtance, that the ſtrange doctrine of the fœtus in utero being deſtitute of ſenſation has been advanced.

The breadth of the membranous ſubſtance interpoſed between the parietal bones, being greater than of thoſe which connect the other bones; affords a preſumption, that the head is capable of being more diminiſhed in the direction of the ſhort diameter than in any other; a fact, which the experiments of M. Bandeloque have fully eſtabliſhed.

Both figures were drawn from a dried preparation, on which account, the appearance of the parietal bone, next the temporal bone in figure firſt, and the rugous appearance in the membranous ſubſtance connecting the ſeveral bones in figure ſecond, are peculiarities.

Plate IV.

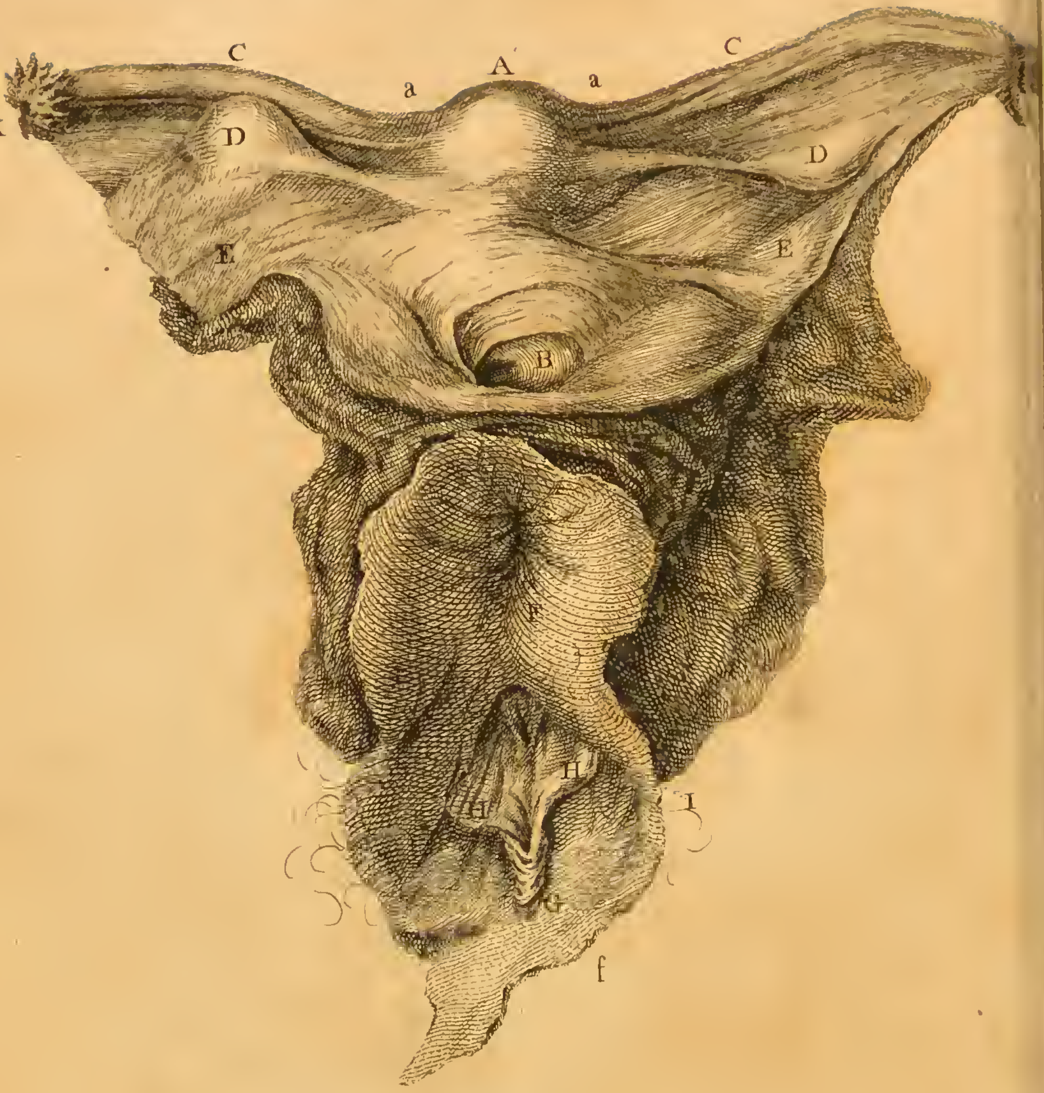

PLATE IV.

SEXUAL ORGANS OF THE FEMALE.

THIS plate exhibits a view of the uterus and appendages, and alſo ſome of the external parts. It is taken from a preparation, made by cutting out of the body, the external and internal parts. This preparation was placed before the painter in ſuch a manner, that the poſterior part of the uterus and chief appendages are repreſented, and the perinæum and anus being turned over upon the vagina, the clitoris, nymphæ, and meatus urinarius, are ſeen from behind. An opening is made at the ſuperior part of the vagina, in order to expoſe the os uteri.

A, The fundus uteri, extending to each ſide; a a, the inſertions of the fallopian tubes.

B, The os uteri.

C C, The fallopian tubes.

D D, The ovaria; that on the left ſide being in its natural ſituation, and that on the right ſide being turned down.

E E, The broad ligaments, which ſupport within their duplicature the uterus itſelf, fallopian tubes, ovaria, &c.

F, The perinæum.

G, The clitoris with its prepuce.

H H, The nymphæ.

I, The meatus urinarius.

K K. The fringed extremities of the fallopian tubes; that on the right ſide being in its natural ſituation, and that on the left being turned back, to ſhow the orifice of the tube.

The natural appearance of the uterus and its appendages in the unimpregnated ſtate, is pretty accurately repreſented in this plate, and the proportions of the various parts to each other are well preſerved.

It might appear from this plate, that the uterus is ſupported *in ſitu,* by the broad ligaments; but this is not the caſe, for it is the vagina that chiefly ſerves that purpoſe.

The breadth of the perinæum was long imagined to form a criterion by which chaſtity could be aſcertained, but this is now well known to be an error.

The ſituation of the meatus urinarius ought to be well known by every practitioner of midwifery. It generally lies as is repreſented in this plate I, about three quarters of an inch from the clitoris, in a ſtraight line from the glans.

Plate V

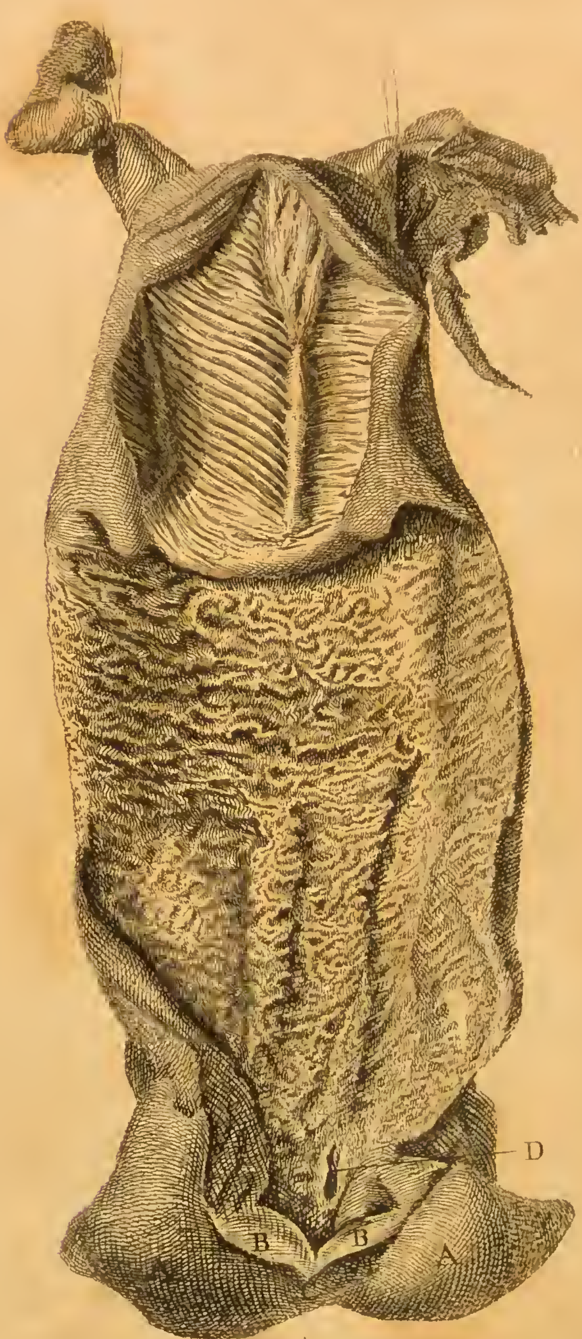

PLATE V.

SEXUAL ORGANS CONTINUED.

This plate repreſents the uterus and vagina of a child about the tenth or eleventh year, ſlit open.

A A, The labia.
B B, The nymphæ.
C, The clitoris.
D, The meatus urinarius.

In this plate, which it muſt be allowed, is more ſubſervient to the gratification of curioſity, than to the purpoſes of utility, the rugæ of the vagina and of the uterus, are moſt beautifully repreſented.

Anatomiſts have generally imagined the carunculæ myrtiformes, to be the remains of the ruptured hymen; but they are in fact, the incipient rugæ of the vagina.

It is of ſome conſequence to correct this error, becauſe theſe firſt rugæ are liable to ſwelling, and hence, might become the ſubject of an chirurgical operation, were a practitioner to regard them as the uſeleſs remains of a membrane neceſſarily deſtroyed.

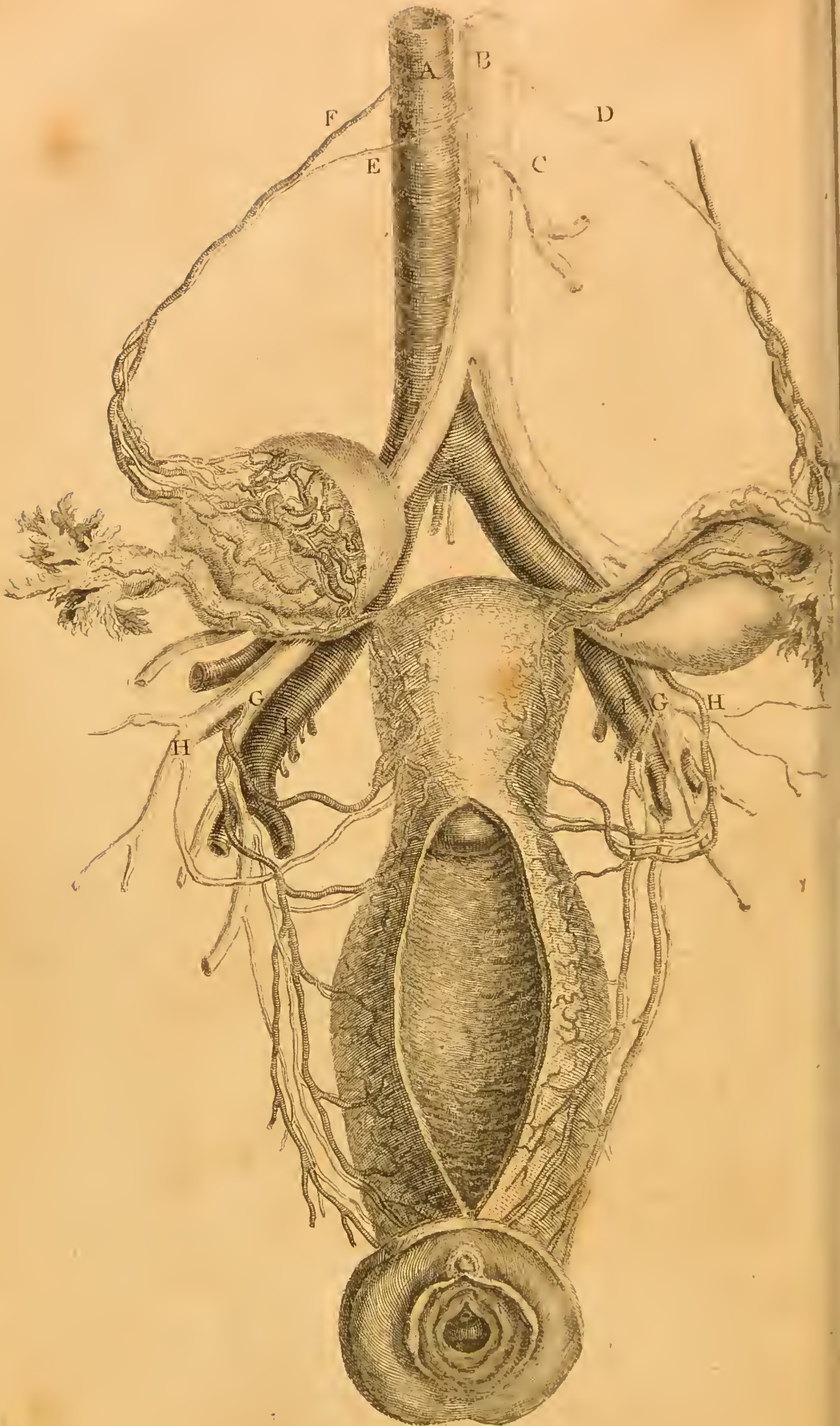
A
B
F
D
E
C
G
I
H
I
G
H

PLATE VI.

SEXUAL ORGANS CONTINUED.

This plate (copied from Boehmer), is deſigned to ſhew the vaſcular ſyſtem of the ſexual organs. Although not a ſtrict repreſentation of nature, it is ſufficiently accurate for practical purpoſes.—The letters of reference are different from thoſe in the original. They are alſo much leſs numerous, becauſe it is preſumed, that a particular explanation is unneceſſary.

A, The vena cava.

B, The aorta cut off above the ſpermatics.

E D, The ſpermatic arteries.

C, The inferior meſenteric artery dividing into two branches, the ſuperior of which forms the colica ſiniſtra, and the inferior the internal hæmorrhoidal.

F, The right ſpermatic vein.

G G, The hypogaſtric arteries.

H H, The branches of the hypogaſtrics ſent directly to the uterus.

I I, The hypogaſtric veins.

The irregular diſcharges of blood, which ſometimes take place during pregnancy, are readily explained by this plate.

Theſe diſcharges proceed from the vagina, in conſequence of the branches of the hypogaſtric diſtributed through it being over-diſtended, a circumſtance that is the natural effect of the increaſed determination of fluids to the uterine veſſels with which thoſe of the vagina are ſo intimately connected.

This accounts more rationally for thoſe diſcharges, than the ſuppoſition that they are irregular appearances of the catamenia; an opinion common among women, and generally admitted even by practitioners.

The phenomena of the gravid uterus, it might be imagined ſufficiently contradict this idea, ſeeing that the os uteri is accurately ſealed up from a very ſhort time after impregnation.—But thoſe who have long cheriſhed the opinion, that the menſes ſometimes continue during pregnancy, will not probably be convinced of their error by proofs furniſhed by theory alone.——They will require ſome more ſtriking evidence. When the appearances of the diſcharges in queſtion are accurately examined, it is found that the evacuation is either in ſmall quantity unattended with pain, or in conſiderable quantity accompanied with pain in the lumbar region.—In the former caſe, the marks on the cloaths are not of an uniform colour, throughout their whole extent, but are of a deep red in the centre, and gradually become paler towards the circumference. In the latter, the diſcharge comes off in coagula or clots. In both inſtances, therefore, the appearances are quite different from thoſe of the menſtrual evacuation.— The periods of the recurrence, too, of theſe diſcharges are irregular; but ſome exceptions to this remark are occaſionally obſerved in practice.

It may therefore be concluded, that the catamenia cannot poſſibly occur during pregnancy.

Blood may be diſcharged from the uterine veſſels, as well as from thoſe of the vagina during geſtation, but ſuch an event is always attended with ſymptoms threatening abortion.

Plate VII.

Fig. 1.

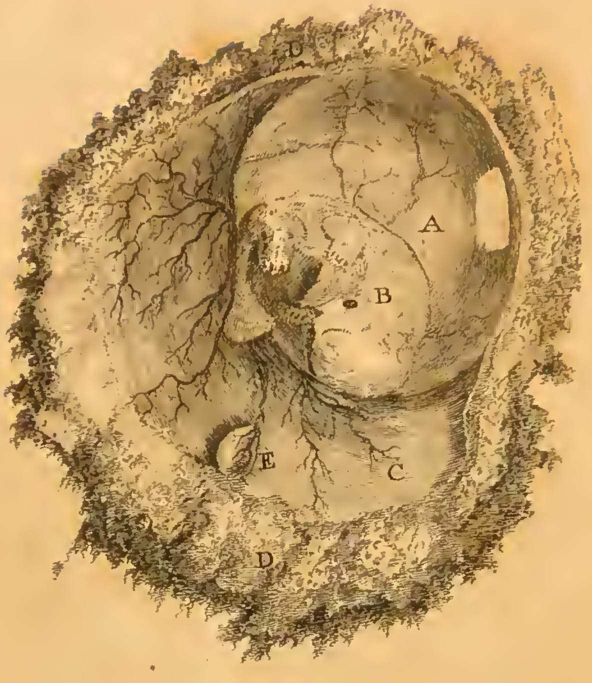

Fig. 2.

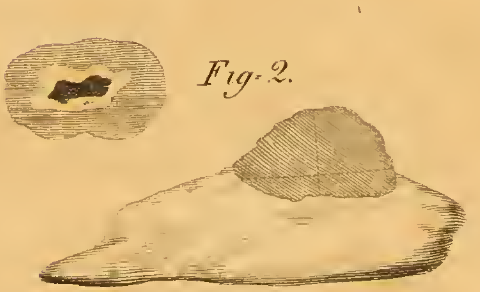

PLATE VII.

EFFECTS OF IMPREGNATION,

FIGURE *1ſt* repreſents the ovum ſuppoſed about the fifth week, prepared by cutting away a conſiderable part of the chorion, and turning aſide the amnion, with the incloſed fœtus, and conſiderably magnified, to ſhew the parts more diſtinctly. It is copied from figure 2d of Dr Hunter's 34th plate; but the letters of reference are different.

A, The amnion diſtended with a liquor as tranſparent and void of colour as the cleareſt water through which the minute parts of the fœtus were diſtinctly ſeen.

B, The fœtus attached to the inſide of the amnion (which at that place was contiguous to the chorion) by its belly, there being no umbilical cord.—The abdominal viſcera were apparently not covered.

C, The ſpace between the amnion and the chorion, extending to the angle at the ſuperior letter D.—This was filled with a tender jelly, ſo tranſparent as to be almoſt inviſible; whence the branching arteries and veins, filled with red blood, upon the inſide of the placenta, were diſtinctly ſeen through it.

D D, The ſhaggy veſſels of the chorion.

E, The veſicula umbilicalis diſtended with a fluid. It was neither attached to the amnion nor the chorion; ſurrounded with the tender jelly, it was connected as by a pendicle to the navel of the fœtus by an artery and a vein, which lay ſo cloſe together, as to appear like one veſſel filled with red blood, and diſperſing its branches to the veſicula umbilicalis alone.

FIGURE 2*d* repreſents two views of the corpus luteum, copied from Boehmer.

Plate VIII.

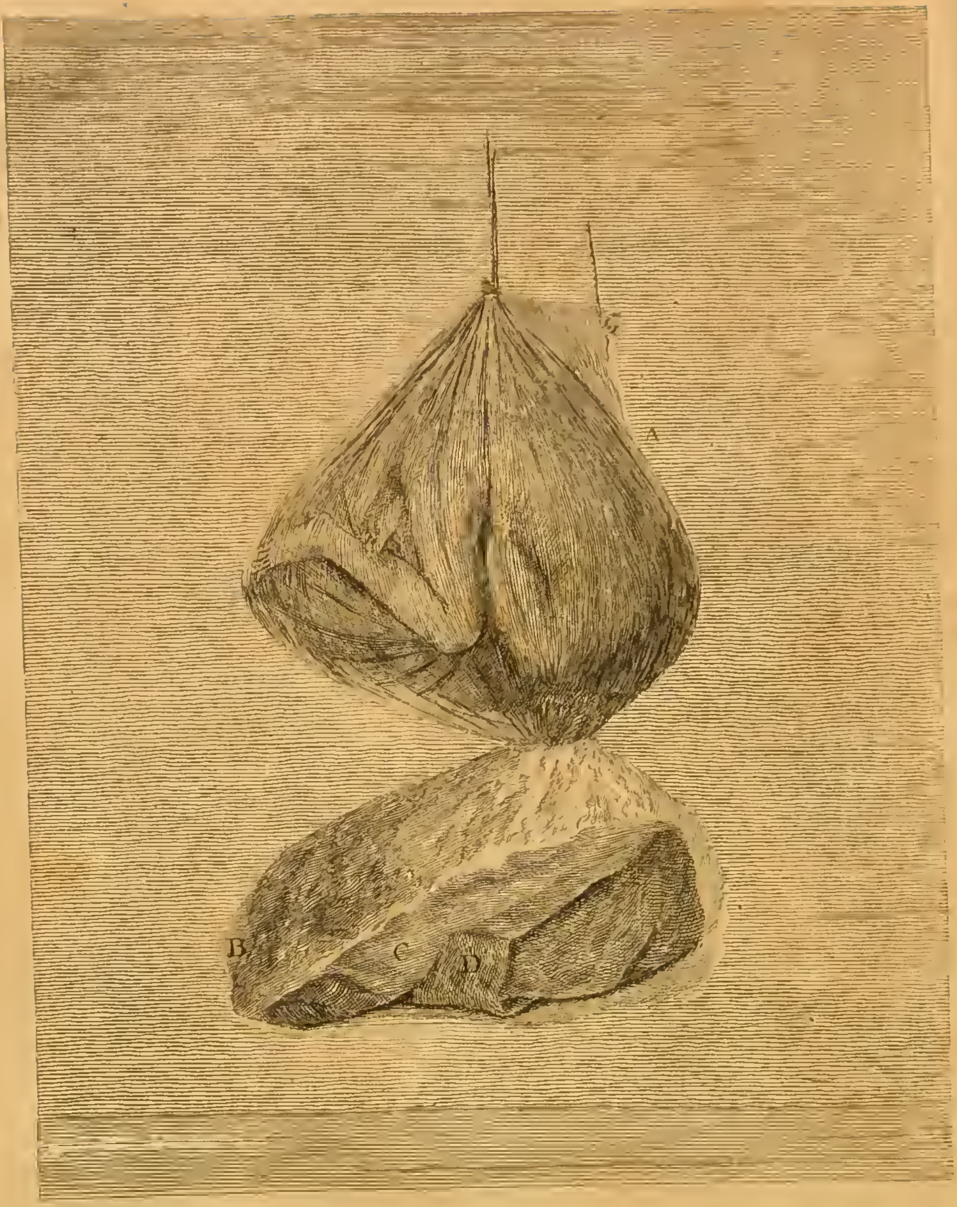

PLATE VIII.

EFFECTS OF IMPREGNATION, CONTINUED.

Represents the Ovum about the fourth month. The chorion, decidua, and placenta, are turned back, ſo that the fœtus is ſeen through the amnion ſurrounded by the liquor amnii.

A, The amnion.

B, The chorion.

C, The decidua vera.

D, The ſurface of the placenta next the uterus.

The ovum at this period conſiſts of three membranes, (the decidua reflexa being now obliterated), viz. the decidua vera, the chorion, and the amnion, a ſpongy vaſcular maſs the placenta, and a diſtinctly formed fœtus ſurrounded by liquor amnii, in ſuch proportion that the embryo can commonly touch the amnion, which it could not before this period do.—It is on this account that the firſt ſenſation of the motion of the child is ſeldom felt ſooner than about the fourth month. Inſtances however have occurred, where this was perceived even about the end of the eleventh or twelfth week. The veſſels connecting the ovum to the uterus at this period, are ſo ſtrong that they are difficultly lacerated by an increaſed impetus of the blood; and ſo large that, when divided, they diſcharge within a very ſhort ſpace of time a large quantity of blood.—The former circumſtance renders abortions at this period rare, and the latter occaſions much danger when that accident actually happens.

Plate IX.

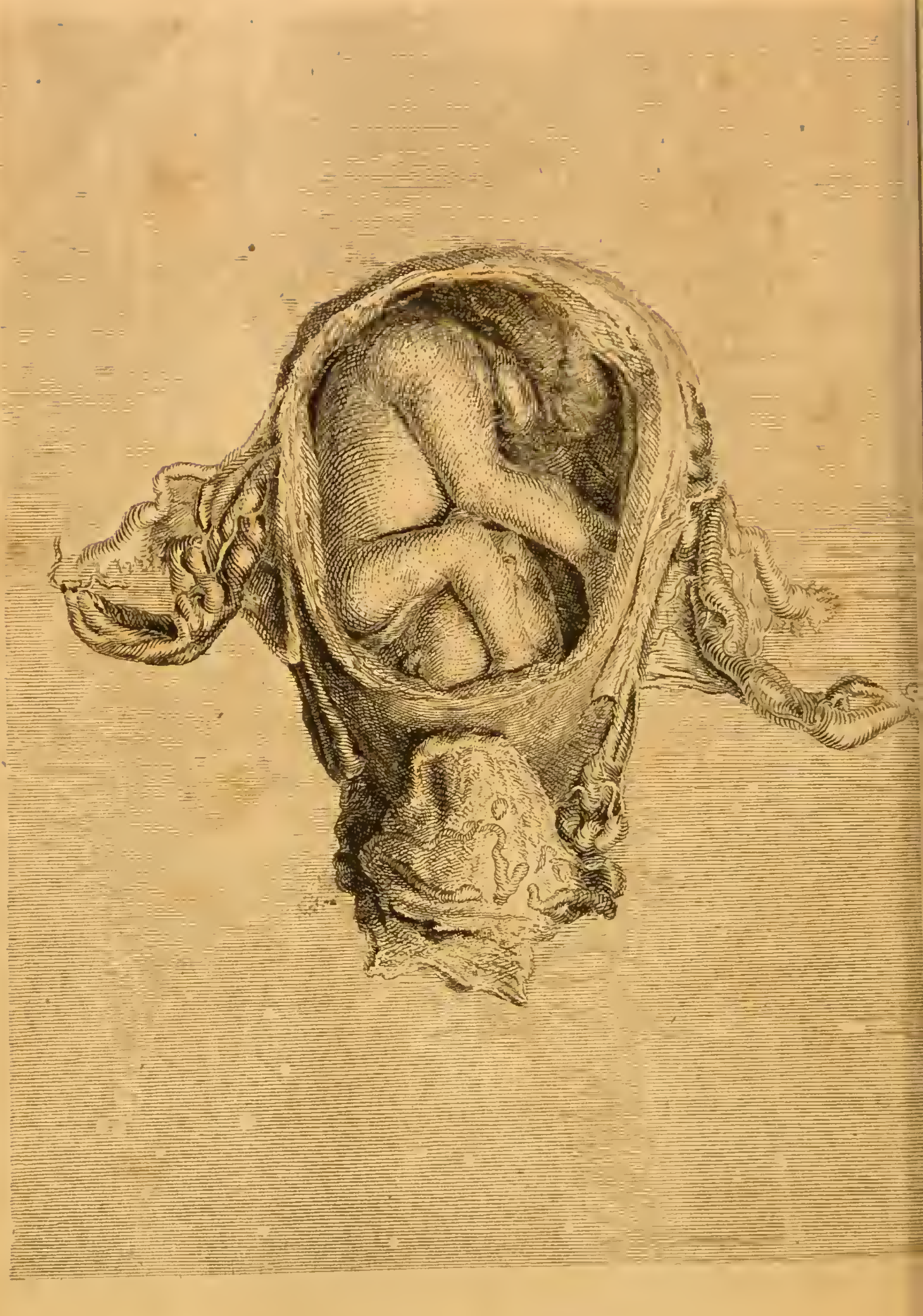

PLATE IX.

EFFECTS OF IMPREGNATION, CONTINUED.

THIS Plate repreſents a view of the Gravid Uterus, and its contents at the ſixth month, copied from Dr Hunter's twenty-third plate.

The letters of reference are omitted; becauſe, in the original, they relate to parts which, in this miniature, are too ſmall to be diſtinctly ſeen.

Neither the cervix, nor os uteri, are exhibited; as the urinary bladder is repreſented to be left remaining.—This is of little conſequence, ſeeing that the changes on the cervix and os uteri are not ſo regular as ſome authors have imagined.

The diſtance of the head of the infant, from the part at which it may be ſuppoſed the os tincæ was placed, explains the cauſe of the reſiſtance commonly oppoſed to the progreſs of the child, in caſes, where labour is by ſome accidental cauſe brought on at this and even a later period of geſtation.

It is this circumſtance which affords the ſtrongeſt objection againſt the propoſal of inducing premature labour in caſes of deformity of the pelvis, the great object of preſerving the life of the infant being thus it is alleged fruſtrated.

But as the expedient alluded to ought only to be had recourſe to, where there is a moral certainty, that no other means can be ſuggeſted for affording a probable chance of ſaving both mother and child, there ſeems to be no alternative. If children, brought forth at the ſeventh month of geſtation, by women, the ſtructure of whoſe pelvis obſtructs irremediably the paſſage of a full grown infant, have been born alive; and if the operation by which labour can be excited at that period, have been proved by experience to be conſiſtent with the ſafety of the woman, recourſe to this expedient becomes a matter of neceſſity, not of choice.

Plate X.

Fig. 1

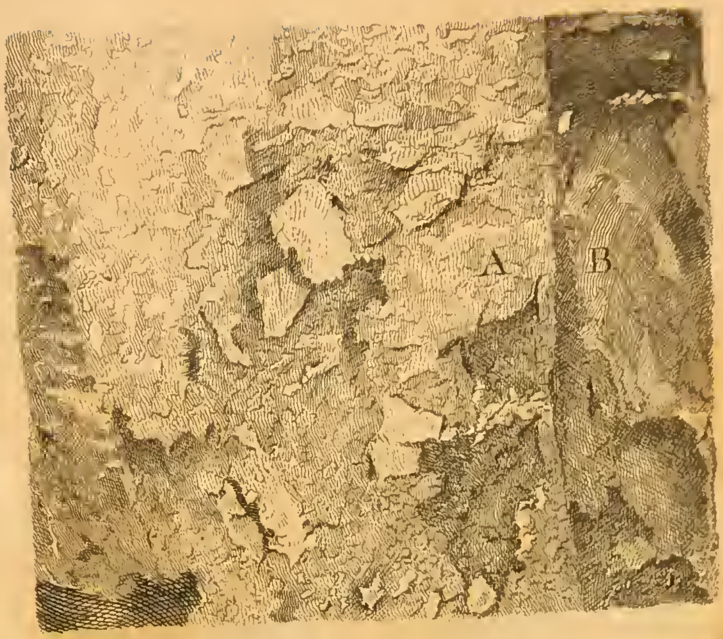

Fig. 2.

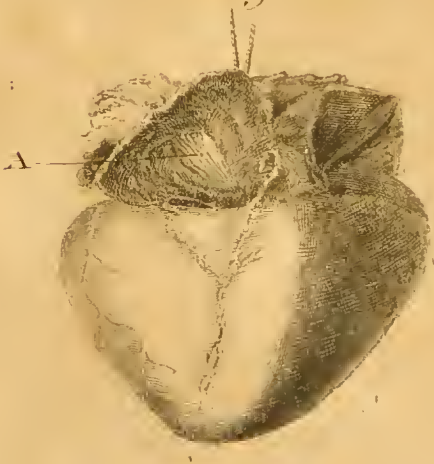

PLATE X.

EFFECTS OF IMPREGNATION, CONTINUED.

FIGURE *1ſt*, Repreſents a ſection of the Uterus, with the Placenta turned back, to ſhew the manner in which the blood-veſſels of the uterus are connected with the ſubſtance of the placenta.

A, The ſurface of the placenta turned back from the uterus.

B, A portion of the ſurface of the uterus, from which the placenta had been ſeparated.

The nature of the connection between the uterus and the placenta, was firſt accurately diſcovered by Mr. John Hunter.—The following account of his diſcovery is inſerted here, becauſe it illuſtrates clearly the ſubject repreſented by this figure.

*" The late indefatigable Dr Mackenzie, about

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* Vide obſervations on certain parts of the Animal Œconomy, by John Hunter, p. 37.

the month of May 1754, when aſſiſtant to Dr Smellie, having procured the body of a pregnant woman, who had died undelivered at the full term, had injected both the veins and arteries with particular ſucceſs; the veins being filled with yellow, the arteries with red.

Having opened the abdomen, and expoſed the uterus; he made an inciſion into the fore-part, quite through its ſubſtance, and came to ſomewhat having the appearance of an irregular maſs of injected matter, which afterwards proved to be the placenta. This appearance being new, he ſtopped, and greatly obliged me, by deſiring my attendance to examine the parts, in which there appeared ſomething ſo uncommon. This examination was made in his preſence, and in the preſence of ſeveral other gentlemen whoſe names I have now forgotten.

I firſt raiſed, with great care, part of the uterus from the irregular maſs above mentioned; in doing which I obſerved regular pieces of wax paſſing obliquely between it and the uterus, which broke off, leaving part upon this maſs; and when they were attentively examined, towards the uterus, plainly appeared to be a continuation of the veins paſſing from it to this ſubſtance or placenta.

I likewiſe obſerved other veſſels, about the ſize of a crow-quill, paſſing in the ſame manner, although not ſo obliquely ; theſe alſo broke upon ſeparating the placenta and uterus, leaving a ſmall portion on the ſurface of the placenta ; and on examination they were diſcovered to be continuations of the arteries of the uterus. My next ſtep was to trace theſe veſſels into the ſubſtance of what appeared placenta, which I firſt attempted in a vein ; but that ſoon loſt the regularity of a veſſel, by terminating at once upon the ſurface of the placenta in a very fine ſpongy ſubſtance ; the interſtices of which were filled with the yellow injected matter. This termination being new, I repeated the ſame kind of examination on other veins, which always led me to the ſame terminations, never entering the ſubſtance of the placenta in the form of a veſſel. I next examined the arteries, and tracing them in the ſame manner toward the placenta, found that they made a twiſt, or cloſe ſpiral turn upon themſelves, and then were loſt on its face. On a more attentive view, I perceived that they terminated in the ſame way as the veins ; for oppoſite to the mouth of the artery, the ſpongy ſubſtance of the placenta was readily obſerved, and was intermixed with the red injection.

Upon cutting into the placenta, I diſcovered in many places of its ſubſtance, yellow injection ; in others red, and in many others theſe two colours mixed. This ſubſtance of the placenta, now filled with injection, had nothing of the vaſcular appearance, nor that of extravaſation, but had a regularity in its form which ſhowed it to be a natural cellular ſtructure, fitted to be a reſervoir for blood.

In ſome of veins leading from the placenta to the uterus, I perceived that the red injection of the arteries, (which had been firſt injected) had paſſed into them out of the ſubſtance of the placenta, mixing itſelf with the yellow injection."

FIGURE 2*d*, Exhibits a view of the heart of the fœtus, in order to ſhew the foramen ovale.

A, The foramen ovale.

It has been long known, that in the partition between the auricles of the heart in the fœtus, there is a conſiderable perforation of an oval ſhape, with a valve ſo attached to it, that a fluid may paſs from the right to the left auricle, but not from the left to the right;—and it has been commonly believed, that a portion of the blood brought to the heart by the venæ cavæ, actually does paſs in this manner.

Speculating upon this theory, ſome phyſiologiſts have accounted for the power which the fiſhers of pearls, &c. acquire of remaining under water for ſome time without breathing, by ſuppoſing, that in ſuch perſons the foramen ovale continues open.

A very ſtrong objection however occurs againſt the opinion, that a part of the blood is ſent to the left ſide of the heart through this foramen, *viz.* that it ſuppoſes the action of the auricles to be previous to birth, alternate, and not, as it afterwards is, ſynchronous. If this were the caſe, it may be aſked, by what power is this alteration in the action of the heart accompliſhed on birth? Muſcular motions habitually aſſociated, are with much difficulty ſeparated; and hence, were the action of the auricles alternate for nine months after conception, ſome very active power muſt be applied to interrupt the habit.

Plate XI.

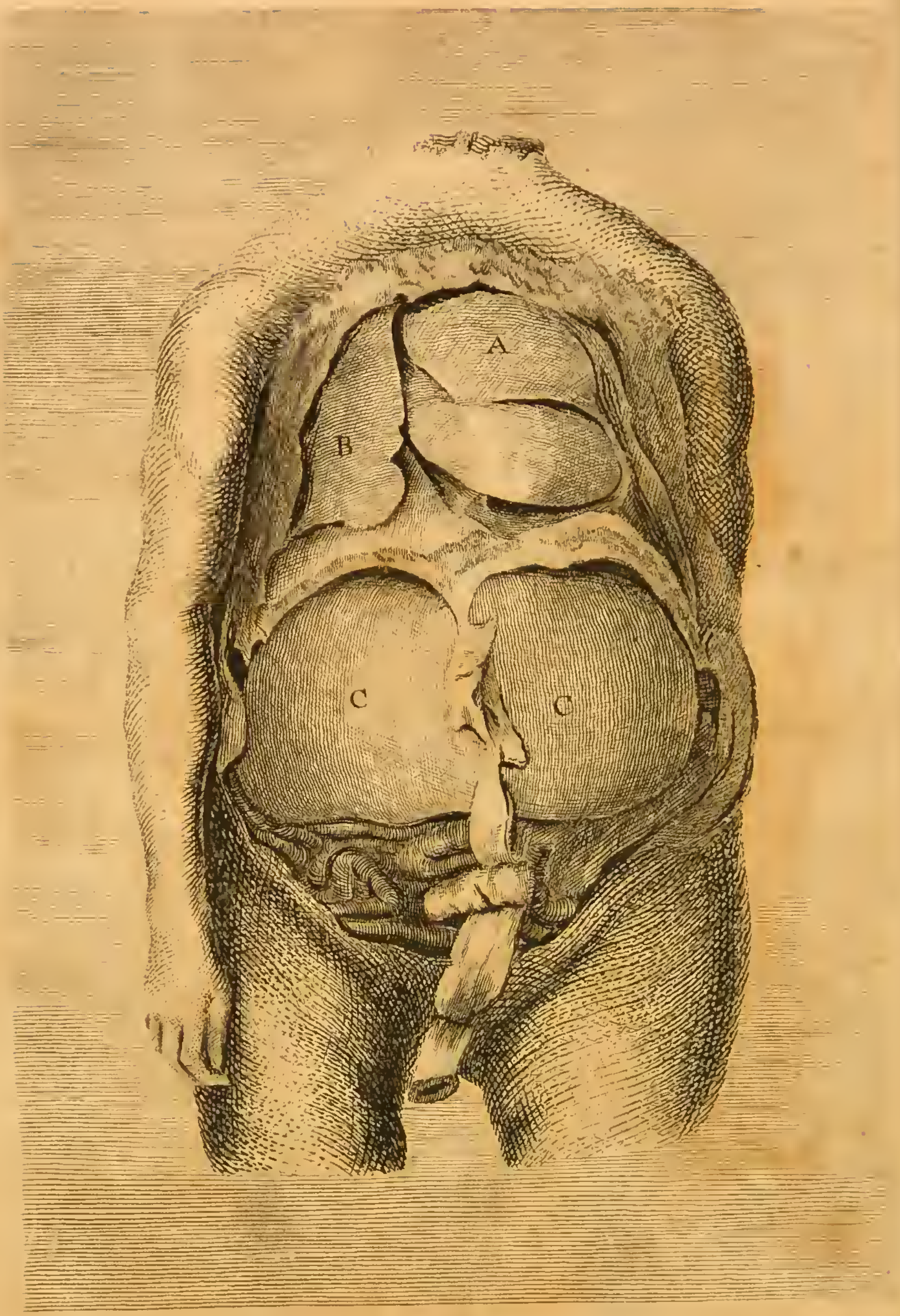

PLATE XI.

EFFECTS OF IMPREGNATION, CONTINUED.

THIS Plate is deſigned to ſhew ſome of the peculiarities of the fœtus.

A, The thymus gland.

B, The right lobe of the lungs.

C C, The liver.

The uſe of the thymus gland is not yet underſtood by phyſiologiſts.

As the lungs previous to the infant's breathing are found collapſed, it is obvious that the act of breathing is not firſt induced by the preſſure of the atmoſphere forcing the air into the lungs; and this is eſtabliſhed beyond the poſſibility of doubt by the lungs of ſtill-born children continuing collapſed.

The means which nature has contrived for beginning the operation of breathing ſeem exceedingly ſimple. The atmoſpherical air applied to the teguments of the face, about the lips and noſtrils, ſtimulate the branches of the fifth pair of nerves there diſtributed; and theſe communicate the impulſe to the intercoſtal nerve, the effect of which is, that the action of the diaphragm and intercoſtal muſcles is excited. Thus a vacuum being produced in the lungs, the air neceſſarily ruſhes in.

Practitioners of midwifery have ſometimes an opportunity of ſeeing a ſtrong proof in favour of the above theory.—The infant is ſometimes born with a portion of the membranes of the ovum covering the face. When this happens when the child is alive, although ſtrong pulſation of the heart be felt, the infant makes no effort whatever to breath; there being no perceptible action of the diaphragm or intercoſtal muſcles; but the moment the membranes are removed from the face, breathing commences.

An additional argument for this explanation is afforded by the phenomena of incipient reſpiration, in caſes where the infant, having been born in a ſtate of ſuſpended animation, is recovered. The breathing is at firſt remarkably interrupted; and an attentive obſerver may perceive diſtinctly, previous to each inſpiration, the action of the diaphragm and intercoſtal muſcles.

The liver is of a prodigious magnitude during the whole period of the fœtal ſtate, and indeed is of a large ſize for the firſt two or three years after birth. This natural circumſtance has been ſometimes miſtaken for a diſeaſed appearance.

That the liver in the fœtus muſt perform ſome very important function cannot be doubted; but that it has not the ſame connection with the chylopoetic viſcera which it has after birth, is evident; becauſe it is of a large ſize, and poſſeſſes an apparent perfection of ſtructure, while theſe viſcera are ſcarcely organized.

The moſt probable conjecture that can be formed reſpecting the function of the liver in the fœtus is, that it prepares ſomething uſeful, or ſeparates ſomething noxious from the blood returned from the placenta by the umbilical vein; for a conſiderable portion of that blood is diſtributed through the liver before it be tranſmitted to the heart.

Plate XII.

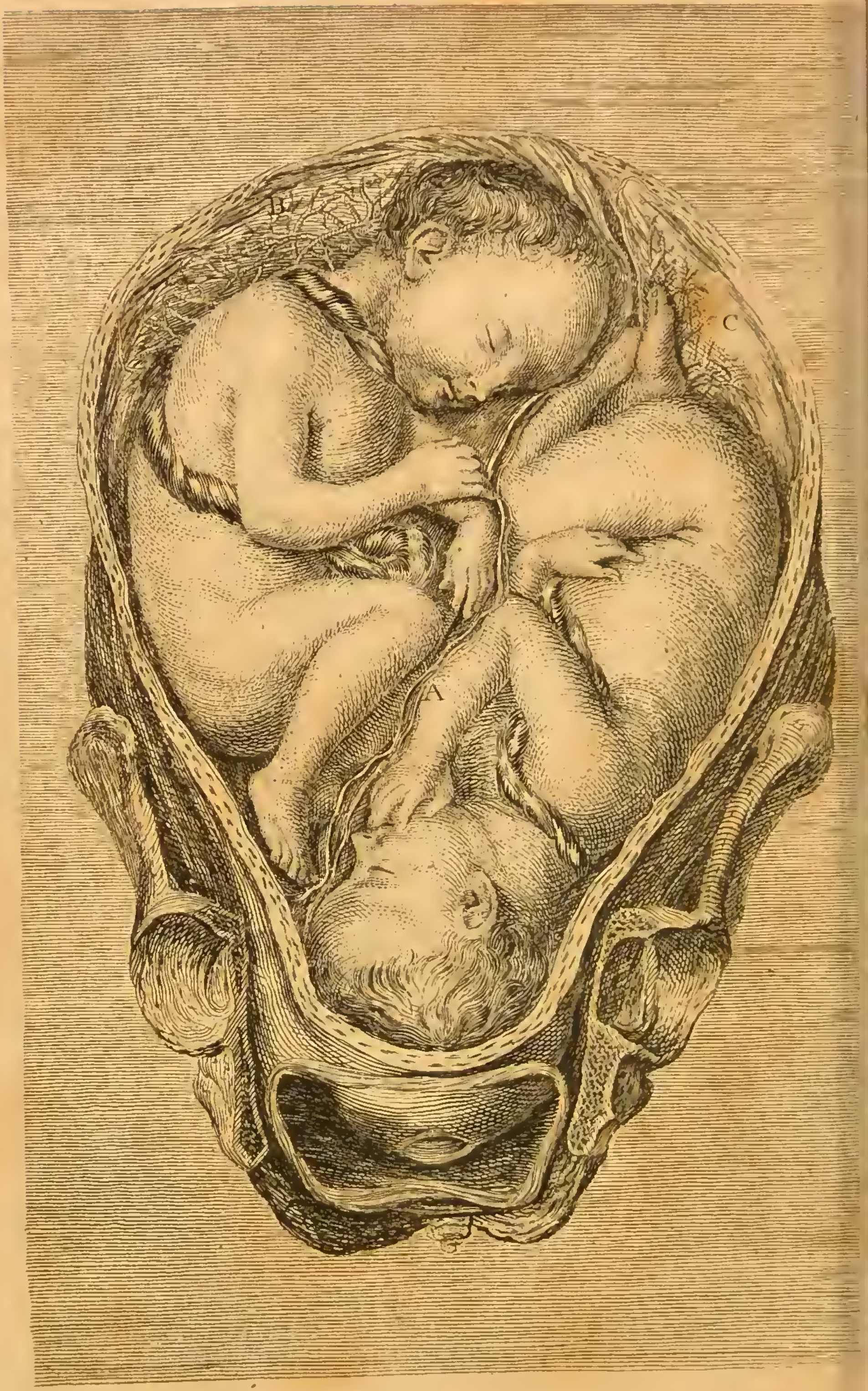

PLATE XII.

EFFECTS OF IMPREGNATION CONTINUED.

This plate is deſigned to ſhew the ordinary poſition of twins in utero, copied from Dr Smellie's tenth plate.

A, The membranous ſeptum between the cavities in which each fœtus was contained.

B C, The placenta here repreſented to be connected together, and attached to the fundus uteri.

In caſes of plurality of children, each fœtus is incloſed in a diſtinct membranous bag, compoſed of the amnion and chorion, and is ſurrounded by a quantity of liquor amnii proper to itſelf. The ſpongy chorion as uſual, lines the whole internal ſurface of the uterus, and hence affords a covering to the membranes immediately containing the ſeveral infants. It is this circumſtance which prevents parts of different children from being frequently found at the ſame time in the paſſage during labour.

Innumerable obſervations have proved, that the poſition delineated in this plate, is the ordinary one of twins, and as no inſtance has hitherto been recorded where twins were obſerved to be differently ſituated in utero, it is perhaps their conſtant poſition, that is to ſay, the head of the one is placed directly oppoſite to the feet of the other, turned back on its breech.

Should this be eſtabliſhed, it muſt follow that in thoſe caſes, when each twin child is born in the natural way, the poſition of the ſecond infant is altered by the action of the uterus, probably during the expulſion of the firſt born.

The poſition of triplets has not yet been aſcertained. The moſt plauſible conjecture on the ſubject ſeems to be, that the third child is placed between the head and the breech, or, more properly ſpeaking, feet of the two others.

The placenta in caſes of plurality of children, are commonly connected, and ſometimes ſo intimately, that the veſſels anaſtomoſe.—Sometimes, however, each placenta is perfectly diſtinct, and attached to a different part of the uterus.

Plate XIII.

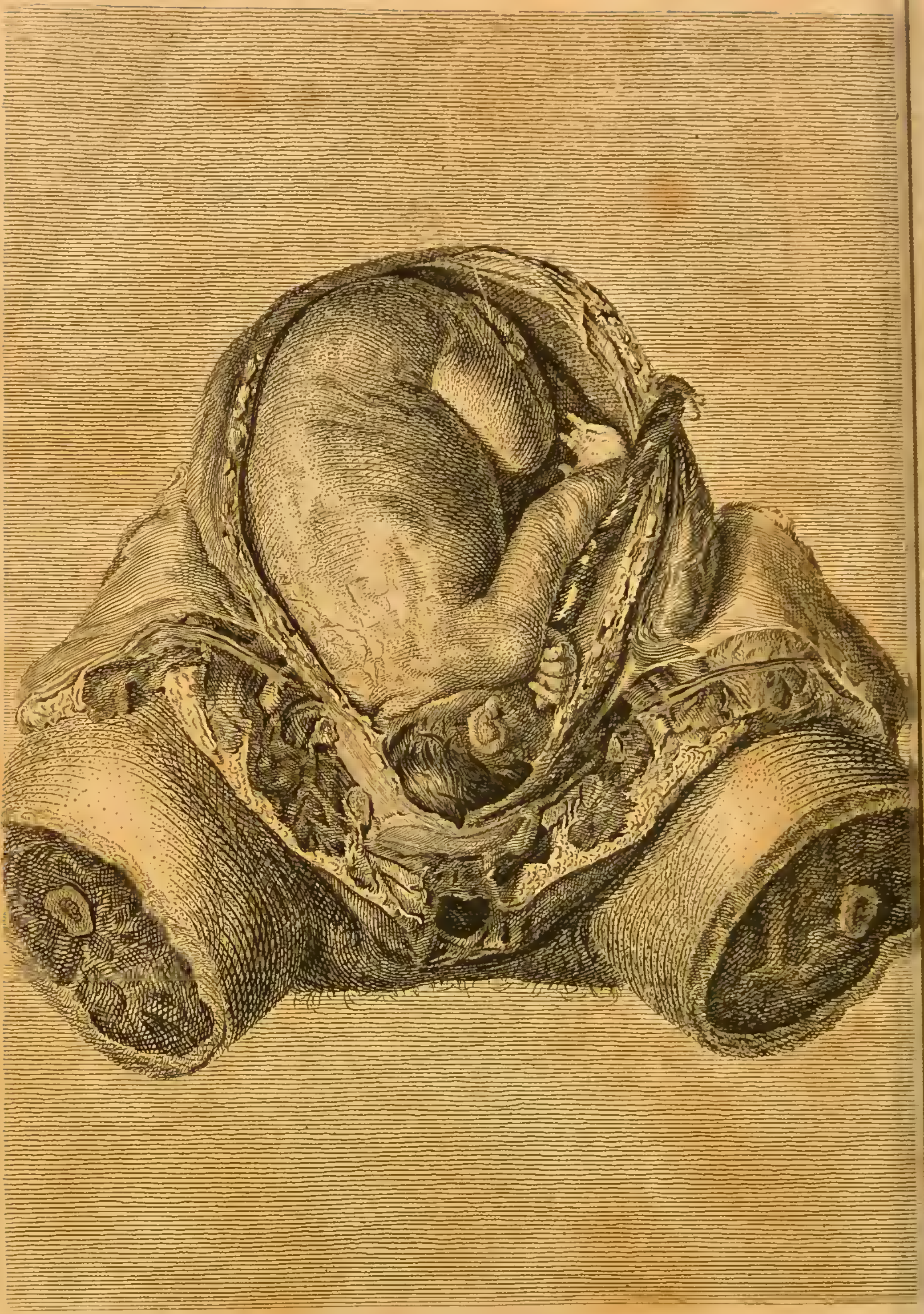

PLATE XIII.

EFFECTS OF IMPREGNATION, CONTINUED.

THIS plate repreſents the natural poſition of the Child in Utero, at the full period of utero-geſtation. It is copied from the beautiful plate executed by Strange, which forms the ſixth of Dr Hunter's collection.

All the forepart, both of the womb and of the ſecundines, (which included the placenta) and the upper part of the urinary bladder, are removed. The navel ſtring is cut, tied, aud turned to the left ſide, over the edge of the uterus. At the fundus, the inveſting membranes are likewiſe turned over the edge of the womb.

The head of the child is lodged in the lower part of the uterus, being partly within the cavity of the pelvis, and its body lies principally in the right ſide. Its poſition is diagonal or oblique, ſo that its poſterior parts are turned forwards, and to the right ſide of the mother, and its poſterior parts are directed backwards and to the left ſide. Its right foot appears between its left thigh and leg. Its body was covered with the white greaſy mucus, commonly ſeen on children at birth. This is repreſented at the upper part of its back, where it was interſected with lines from the wrinkles and motions of the child's body. Every part is repreſented juſt as it was found; not ſo much as one joint of a finger having been moved, to ſhew any part more diſtinctly or to give a more picturesque effect.

Such is nearly the deſcription given by Dr. Hunter of this plate.

The firſt object which attracts notice in this beautiful repreſentation, is the poſition of the child. It is ſomewhat different from what it is repreſented to be in plates eighth and ninth, being more lengthened out. This is a curious circumſtance, as the proportion of liquor amnii having greatly decreaſed, the ſituation of the child is more confined, and hence, it might be imagined the ſeveral parts ſhould be more completly compacted together.

The cauſe of this alteration in the poſition, perhaps is the weight of the head, together with the reſiſtance oppoſed by the promontory of the ſacrum to the deſcent of the ſhoulders.

The effect, whatever be the cauſe, is highly beneficial; for the head of the child is thus placed in the ſituation moſt favourable for delivery, being in the direction of the longeſt diameter of the pelvis in the living ſubject.

The next circumſtance that would probably ſtrike an obſerver, is the unſupported ſtate of the fundus uteri. The ligaments remaining at the brim of the pelvis, almoſt three fourths of the uterus, are unconnected with any other part. As the placenta is very commonly attached to the fundus, this renders partial inverſion of the uterus not an uncommon accident in the hands of ignorant operators. And it muſt be obvious, that little force is required to invert all that portion which is above the ligaments. A degree of force, on the contrary, is neceſſary to ſeparate the uterus from its attachments to the ſides of the pelvis, and thus, to completely invert and pull it out of the body, which it were impoſſible to believe could have ever been exerted on the living ſubject, did not the moſt inconteſtible evidence convince us of the fact.

It muſt however be allowed, that by far the greater number of caſes recorded by practitioners as inſtances of complete inverſion are actually examples of partial inverſion. The phenomena invariably deſcribed in ſuch caſes unequivocally prove it. In complete inverſion there can be little or no hæmorrhagy, becauſe the veſſels which principally ſupply the uterus with blood muſt inevitably be torn away from the ſides of the pelvis, and hence ſeparated from their ſource: Yet hæmorrhagy is generally deſcribed as the moſt alarming ſymptom in thoſe hiſtories of inverted uterus.

The unequal thickneſs of the parietes of the uterus in different places, although not very diſtinctly marked in this plate, ought always to be kept in view by a practitioner. This, together with the ſpongy texture of the ſubſtance of the uterus, renders the operation of turning always attended with the riſk of the hand being forced into the abdomen among the inteſtines.

Plate XIV.

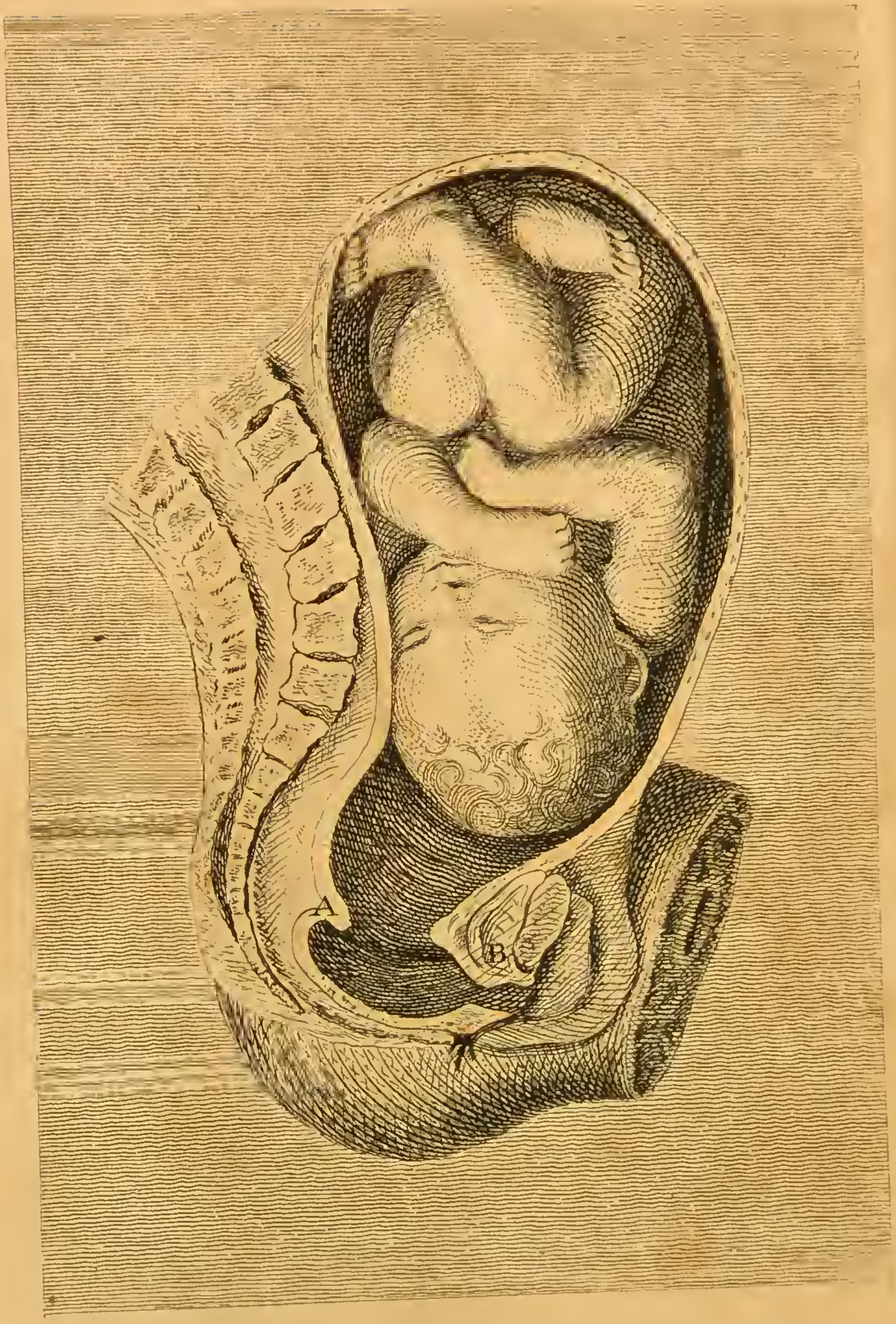

PLATE XIV.

PHENOMENA OF PARTURITION.

THIS plate, copied from Dr Smellie's twelfth plate is deſigned to repreſent the ſituation of the child, and ſtate of the paſſages during the latter part of the firſt ſtage of labour.

A, B, The os uteri in a ſtate of dilatation.

The ſituation of the child here delineated is not that which takes place at the beginning of natural labour, but is that which is occaſioned by the ſtrong action of the uterus, when the dilatation of the os tincæ is conſiderably advanced, and before the liquor amnii is diſcharged.

The natural poſition when labour begins is repreſented in Pl. xiii. ; for which reaſon it was placed immediately before that at preſent under conſideration. To underſtand the infant's poſition relatively to the cavity of the pelvis, (which cannot be done by looking at Pl. xiii.), let it be ſuppoſed that, in this plate, the head is in contact with the os uteri, A B.

The firſt effect of the uterine action in natural labour, is to ſeparate the parietes of the os tincæ, and hence to diſcharge the mucus which had from a very ſhort time after conception cloſed up that orifice.

When the diameter of the opening thus made is ſomewhat ènlarged, a portion of the membranes containing the liquor amnii is forced though into the vagina during every pain. This membranous bag diſtended with fluid gradually becomes larger, and extends lower in proportion as the edges of the os tincæ are ſeparated from each other. When this orifice is nearly opened to its full extent, the bag is during every pain forced forward, while, at the ſame time the head of the child mounts upwards out of the cavity of the pelvis, as is repreſented in this plate. On the ceſſation of the pain the membranes become flaccid, the liquor amnii recedes, and the head of the infant falls down apparently by its own gravity into the pelvis, ſo as to be in contact with the os uteri.

The dilătation of the os uteri, and the protruſion of the membranous bag afford the only certain marks by which the commencement of labour can be aſcertained; and therefore, unleſs a practitioner is certain that either of theſe circumſtances has happened, he cannot pronounce a patient to be in labour, whatever other ſymptoms may be preſent.

The protruſion of a membranous bag, however, is not of itſelf an unequivocal ſymptom of the commencement of labour; for ſometimes during the latter weeks of geſtation, violent pains take place ſimilar to thoſe of labour, and the veſica urinaria is forced down, imitating very exactly the bag formed by the membranes of the ovum.

This fact was firſt explicitely pointed out in a late publication, by the author of theſe remarks *. As he conſidered the obſervation to be of eſſential practical utility, he uſed the following expreſſions in that work, which he here takes the liberty to repeat.

" By this fact, an important precaution is ſuggeſted; for, if the practitioner be not aware of the circumſtance, he muſt not only frequently keep his patient in a ſtate of unneceſſary alarm for many days; but even alſo may injure her irreparably, by lacerating the bladder."

He has been conſulted in many caſes of incontinence of urine, from this cauſe, where he had to regret, that the occurrence alluded to is not more generally known among practitioners.

The bag formed by the protruſion of the urinary bladder, may be readily diſtinguiſhed by the operator,

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* Select caſes of midwifery, extracted from the records of the Edinburgh General Lying-in Hoſpital, with remarks by J. H. Jun. M. D. See p. 15.

rator, feeling it impoſſible to paſs the finger all round its circumference as he can, when the membranes of the ovum are protruded, for it is attached firmly to the fore-part of the pelvis; and by his being able, during the interval of a pain, to feel the os tincæ quite undilated or nearly ſo.

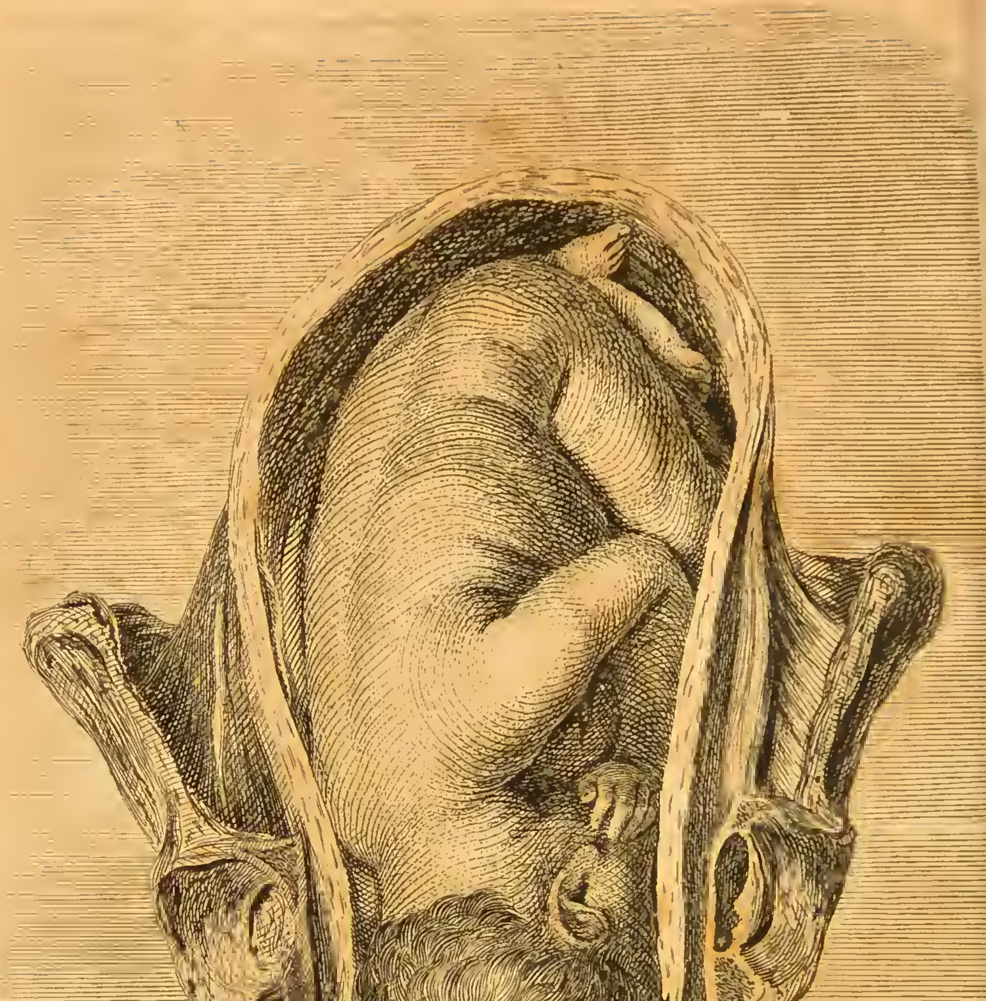

PLATE XV.

PHENOMENA OF PARTURITION, CONTINUED.

THIS plate exhibits the ſituation of the child during the beginning of the ſecond ſtage of natural labour. It is copied from the thirteenth table of Dr Smellie.

Soon after labour has advanced as much as is repreſented in Plate XIV, the membranes give way during a pain, the os uteri is completely dilated, and the head of the child, partly protruded through it, is forced down, ſo as to occupy almoſt entirely the cavity of the pelvis. This is the ſituation repreſented in this plate.

The face is here turned towards the left ſacro-iliac ſynchondroſis, the chin being applied cloſe to the top of the breaſt, and the vertex is directed towards the body of the right iſchium.

In this poſition the long diameter of the child's head is in the direction of the long diameter of the cavity of the pelvis, while the head at the ſame time occupies the leaſt poſſible ſpace; the vertex preſenting.

The former circumſtance is occaſioned by the original ſituation of the child at the commencement of labour, not as the ingenious Saxtorph has alledged from the ſhape of the promontory of the ſacrum. The latter is the conſequence of the neck being joined to the head nearer to the occiput than to the face; for the effect of the uterine action exerted on the body of the child being applied to the head at that part, forces forward the vertex.

Two obſtacles prevent the further deſcent of the head in the ſame direction, firſt and principally, the ſpinous proceſſes of the iſchia, and ſecondly, the ſhoulders being applied to the pubes and ſacrum.——The effect, therefore, of the continued action of the uterus at this period of the labour, is to turn the head gradually into the ſituation in which it is repreſented in the following plate.

When it becomes neceſſary to apply the forceps, where the child is in the poſition exhibited in this plate, it is abſolutely neceſſary to know to which ſide of the pelvis the face lies. The tumour commonly formed on the vertex, is, to an experienced practitioner, a ſufficient mark by which this may be aſcertained; but this can never be depended on by others, becauſe it requires a great deal of practice to be able to diſtinguiſh between the natural tumour on the vertex, and a tumour that pretty often is felt on the forehead.—The beſt general rule, therefore, is to feel the poſition of the ear, by paſſing a finger of the right hand under the pubes.

PLATE

Plate XVI.

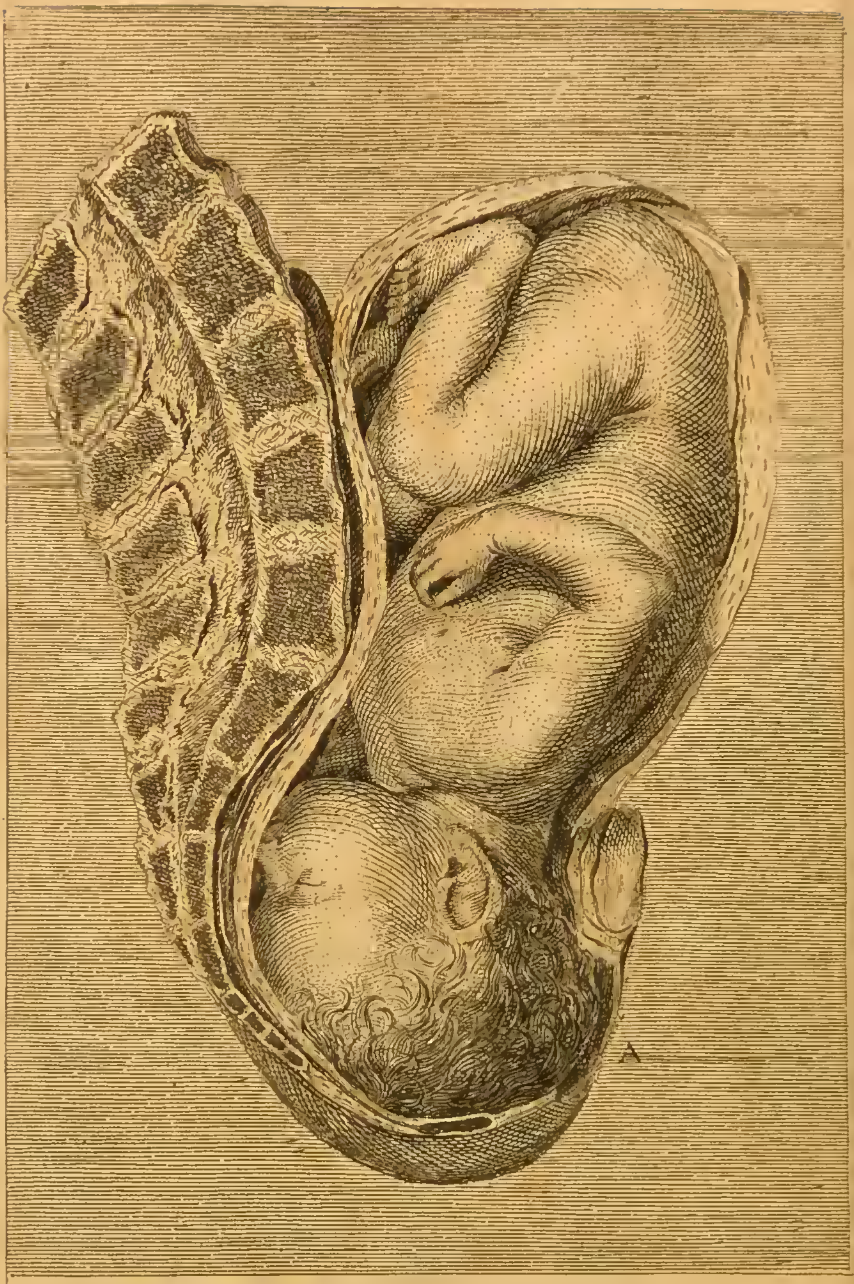

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PLATE XVI.

PHENOMENA OF PARTURITION, CONTINUED.

THIS plate, copied from the fourteenth of Dr Smellie, repreſents the ſituation of the Child during the latter part of the ſecond ſtage of Natural Labour.

A, The external parts.

This plate is deſigned to ſhew that alteration in the ſituation of the child, which, it has been already noticed, takes place ſoon after the head has been in contact with the ſpinous proceſſes of the iſchia, as exhibited in the preceding plate.

The circumſtances which prevent the further progreſs of the child, in the ſame direction in which it had entered the pelvis, have been explained; but the reaſon why the face turns into the hollow of the ſacrum, in preference to the oppoſite part of the pelvis, remains to be ſtated. It is the effect of the unequal preſſure of the ſpinous proceſſes of the iſchia on the ſides of the head: for the proceſs, on one ſide, preſſes on the edge of the parietal bone next the forehead; and the other, on the oppoſite ſide, preſſes on that edge of the correſponding bone which is next the occiput.—This Dr Oſborn has clearly pointed out in the following paſſage.

" This unequal preſſure of the two iſchia upon the head will, in the firſt inſtance, direct the occiput or apex of the cone to turn under the arch of the pubes, where there is little or no reſiſtance; while the preſſure of the other iſchium, in its farther deſcent, will have the ſame effect on the other ſide, and direct or compel the face to turn into the hollow of the ſacrum *."

By this alteration in the poſition of the child, the long diameter of the head is applied to the long diameter of the outlet of the pelvis, while the ſhoulders are made to enter the brim; and at the ſame time the head is ſo placed, that the continued contractions of the uterus have the effect of forcing it out like a cone with its apex foremoſt, by which the ſoft parts are opened in the moſt gradual, and conſequently leaſt injurious, manner.

In the plate at preſent under conſideration, the chin has already in ſome degree receded from the top of the breaſt, on which it had hitherto reſted. In the further deſcent of the head, it is made to ſeparate from that part as far as the mechaniſm of the child will permit. In proportion as the chin thus

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* Vide Eſſays on the Practice of Midwifery, by William Oſborn, M. D. p. 31.

thus recedes, the occiput turns up towards the abdomen. A pretty accurate idea of the curved line, which both the chin and the occiput deſcribe during the gradual exit of the head, may be formed, by ſuppoſing that, in this plate, the chin is brought to a point a little below the inferior edge of the external parts, A.

The vertex is thus made, in its deſcent, to purſue a different line of direction from what it does at firſt, in conſequence of the reſiſtance oppoſed to it by the coccyx and perinæum. This forces it from the axis of the pelvis into that of the vagina; ſo that the ſuperior part of the ſkull being preſſed upon by theſe parts, the head is, by the continuation of the vis a tergo, turned upon the centre of the arch of the pubes (to which the occiput is cloſely applied) as upon a fulcrum.

If this explanation of the proceſs be juſt, it follows, that preſſure on the perinæum during the time that the ſoft parts are protruded in form of a tumour, inſtead of retarding the progreſs of the child's head ought to accelerate it; and experience proves this to be actually the caſe.

This plate affords a demonſtration of the ſuperiority of the curved over the ſtraight forceps; for, as each blade of that inſtrument ought to be applied over the middle of the parietal bone, in order to embrace the ſhort diameter of the head, this could not be accompliſhed with the ſtraight forceps, when the child is in the poſition here repreſented (and it is the moſt common caſe in which the forceps is had recourſe to), unleſs the handles were brought almoſt into contact with the point of the coccyx.

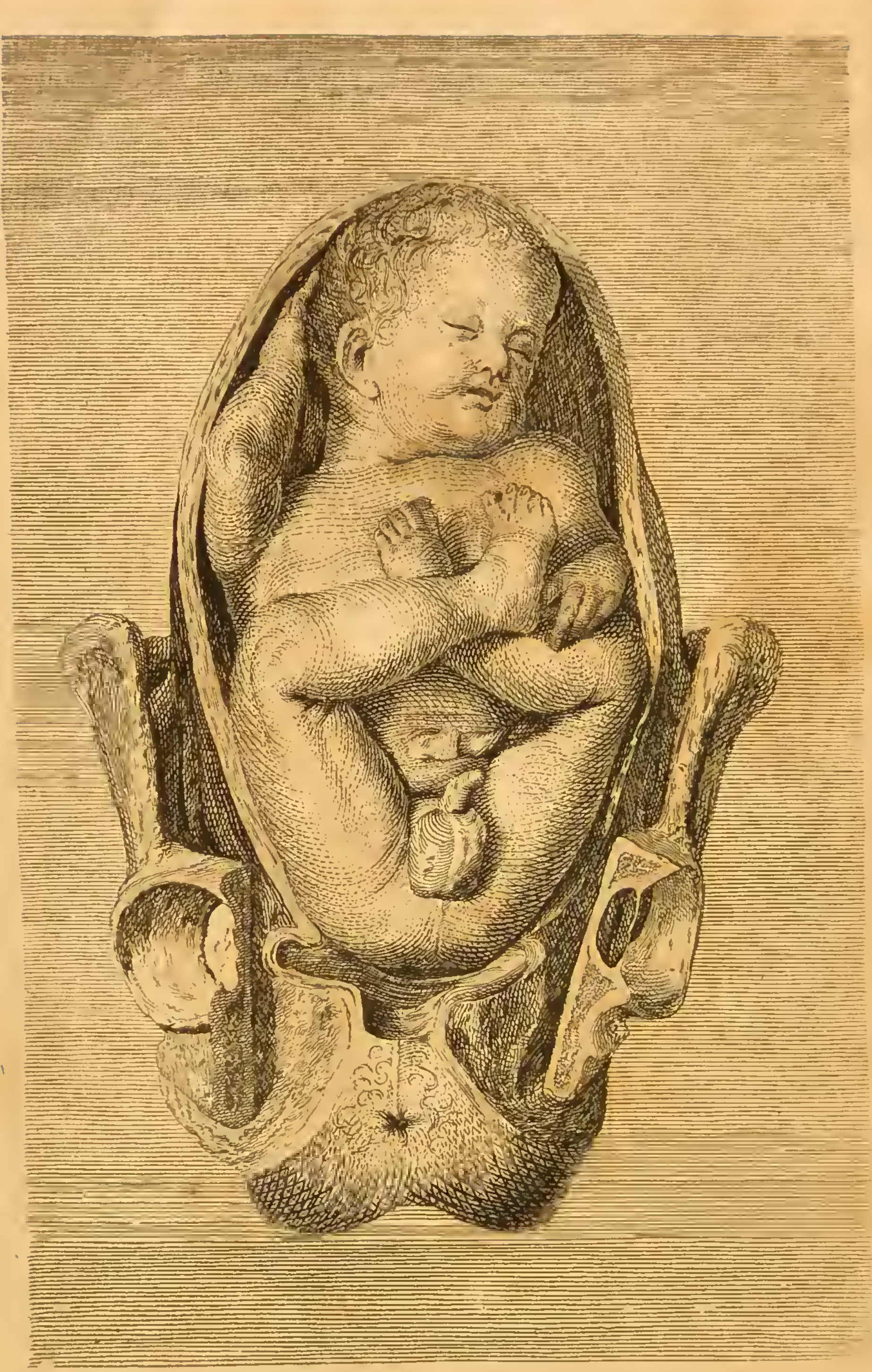

PLATE XVII.

PHENOMENA OF PARTURITION, CONTINUED.

THIS Plate, copied from Dr Smellie's thirtieth table, exhibits a view of the moſt common poſition of the child in preſentations of the breech, which are the moſt frequent caſes of preternatural labours.

In this caſe, although the long diameter of the preſenting part of the child be not in the direction of the longeſt diameter of the pelvis at the brim, nevertheleſs, when the uterine contractions are vigorous, and the mother and child are of the ſtandard proportions, the breech advances pretty rapidly down to the outlet. It is then ſtopt, becauſe the largeſt diameter of the preſenting part is then applied to the ſhorteſt diameter of the pelvis; and hence a prodigious propelling force is required to expel it in this direction, the conſequence of which, is in many caſes, the death of the child, by the long continued compreſſion of the umbilical cord.

When the unaſſiſted contractions of the uterus are inadequate to the expulſion of the infant in this preſentation, three modes of practice have been recommended, viz. the uſe of the hands, or of a fillet, or of inſtruments.

Aſſiſtance may often be afforded, by paſſing two fingers up at one ſide over the groin, and puſhing the child to the oppoſite ſide of the pelvis, during a pain, and on the ſucceeding pain paſſing the fingers of the other hand in the ſame manner, and ſo on alternately.—But, in many caſes, the reſiſtance is too great to be overcome by theſe gentle efforts.

Many practitioners apply, in ſuch caſes, a garter or fillet over one or both groins; but it will ſeldom be found that this expedient is conſiſtent with the ſafety of the child: for the cauſe of reſiſtance is not merely the ſuſpenſion of the propelling powers; it is the long diameter of the preſenting part being in the direction of the ſhort diameter of the pelvis. Although, therefore, by the exertion of a great degree of force in pulling by the fillet, the breech may be brought through the outlet, the violent compreſſion thus occaſioned will moſt commonly prove highly injurious, if not abſolutely fatal, to the infant.

The uſe of the inſtrument that has been moſt generally employed in theſe caſes, by Britiſh practitioners, the blunt-hook, is attended with the ſame diſadvantages, with this additional inconvenience, that, even where it is only required to ſupply or increaſe the vis a tergo (the reſiſtance from the preſenting part, and the ſtate of the paſſages being inconſiderable), its preſſure on the groins of the infant is apt to tear or bruiſe thoſe parts.

For theſe reaſons, the forceps have been recommended by ſome practitioners, and are now excluſively employed under the circumſtances alluded to by the author of theſe remarks. The manner of uſing them is exceedingly ſimple. The blades are applied after the preſenting part has deſcended to the outlet of the pelvis, over the ſides of the child's breech, (thus reſting partly on the outſide of the thigh, and partly on the haunch) with their convex edges towards the hollow of the ſacrum. They are locked and ſecured in the ordinary way. In drawing down, the handles are gradually inclined to one ſide; ſo that the long diameter of the child is directed into the long diameter of the outlet, or, in other words, the belly of the infant is by degrees, during the proceſs of extraction, turned towards one ſide of the pelvis. It is unneceſſary to add, that all the general rules eſtabliſhed for operating with the forceps are attended to.

It has been urged againſt the uſe of the forceps in breech caſes, that their preſſure is liable to injure the breaſt of the infant, or that the hold afforded by the blades is ſo inſecure, that the inſtruments ſlip every time the operator attempts to draw down.

The former of theſe objections is inapplicable to the ſhort forceps, and indeed has been ſuggeſted by thoſe who employ the unweildy inſtruments of Levret. And experience will convince every unprejudiſed practitioner, that the latter is unfounded. To thoſe who adduce the argument of the inſtrument ſlipping from what has happened under their own management, it may be replied, that either the blades of the forceps they had uſed muſt have been too narrow to embrace by a number of points of contact, or that they had not adverted to the great power which the application of the forceps in theſe caſes beſtows, that of accomodating the preſenting part to the paſſage.—In ſhort, that they had endeavoured to bring forward the child as it preſented, inſtead of turning to one ſide, on the principles explained.

Plate XVIII.

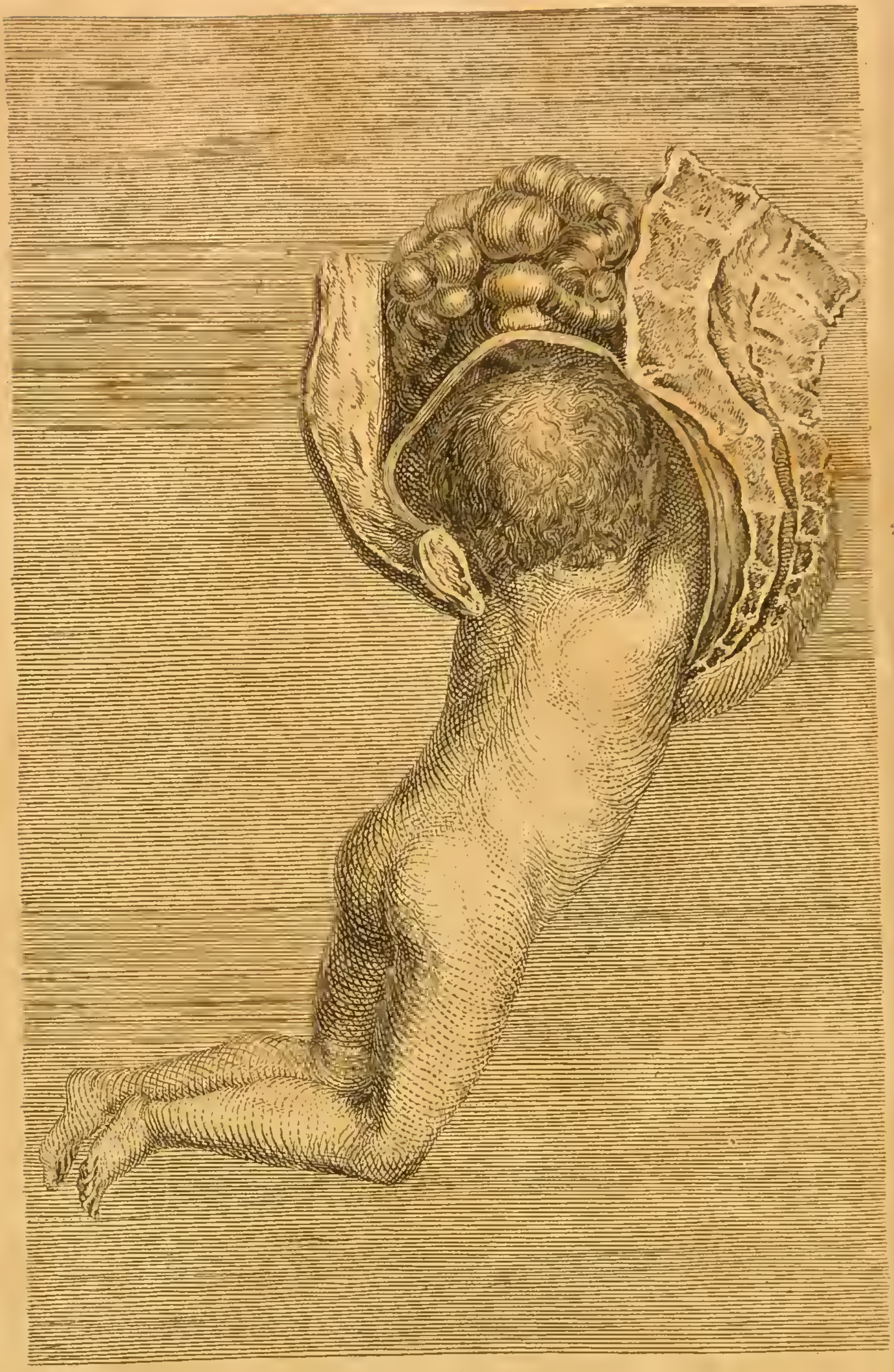

PLATE XVIII.

PHENOMENA OF PARTURITION, CONTINUED.

THIS plate is deſigned to ſhew the poſition into which the child is to be brought, during the proceſs of extraction, in footling caſes.

The principal rules for aſſiſting in preſentations of the feet, are applicable to all caſes of preternatural labours; becauſe a child of the ordinary ſize cannot be made to paſs through the pelvis in any other poſition, than with the head or lower extremities foremoſt; and experience has ſhewn, that, in deviations from the natural preſentation, it is infinitely preferable to bring down the feet than the head.

The general principle to be adopted in the management of footling caſes, is to direct the largeſt diameter of the child through the largeſt diameter of the pelvis.

When the ſhape of the pelvis in the living ſubject, and of the body of the infant, are attentively conſidered, it muſt be obvious, that if the belly of the child be either to pubes or ſacrum, this object cannot be attained, ſince the broadeſt part of its body is thus made to paſs through the ſhort diameter at the outlet.——On the other hand, if the belly be directly to either ſide of the pelvis, although the child be in the poſition the moſt favourable to paſs through the outlet, the large diameter of its body is applied to the ſhort diameter of the brim.

But, if the child be ſo placed, that its belly, its breaſt, and its face, are directed in ſucceſſion towards the ſacro-iliac ſynchondroſis of one ſide, it can then be propelled through the pelvis with the leaſt reſiſtance, as it occupies the leaſt poſſible ſpace.

Accordingly, the author of theſe remarks has for many years ſuggeſted, that, in all preternatural labours, the infant ſhould be gradually brought into this moſt favourable poſition, turning to that ſacro-iliac ſynchondroſis, to which the parts mentioned lie the neareſt.——Where they are equidiſtant from each ſynchondroſis, they ſhould be directed towards the left one; for, if the patient be in the proper poſition (on the left ſide), then the operator can finiſh the delivery with his right hand.

In this plate, the infant is repreſented as having been propelled along the right ſacro-iliac ſynchondroſis, until the breaſt was excluded.—To accompliſh the delivery under ſuch circumſtances, it is neceſſary to diſengage the arms, beginning with that neareſt the ſacrum; next wrapping the body in a ſoft warm cloath, to lay it along the left arm, carrying up two fingers of the correſponding hand into the infant's mouth, and applying the fingers of the right hand ſo as to embrace cloſely the neck at the poſterior part over the ſhoulders; then, firſt bringing the head in the ſame poſition completely into the cavity of the pelvis, to turn the face into the hollow of the ſacrum; and finally, by preſſing on the lower jaw, and at the ſame time inclining the body up towards the abdomen of the woman, to diſengage firſt the face and then the occiput.

By adopting theſe rules, the reſiſtance to delivery after the lower extremities are protruded, ſo commonly complained of, will ſeldom be experienced, and a much greater proportion of infants will be born alive in preternatural preſentations, than can be expected where the directions generally given are followed.

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